

AMENDMENTS TO THE CLAIMS

This Listing of Claims will replace all prior versions and listings of claims in this application.

1. (Currently Amended) A chemical conversion coating agent comprising:
at least one kind selected from the group consisting of zirconium, titanium and hafnium;
fluorine; and
an adhesion and corrosion resistance imparting agent,
wherein said adhesion and corrosion resistance imparting agent comprises 1 to 5000 ppm
(as a silicon component) of a silicon-containing compound (E) and at least one kind selected
from the group consisting of:
1 to 5000 ppm (metal ion concentration) of at least one kind of metal ion (A) selected
from the group consisting of zinc ion, manganese ion and cobalt ion;
1 to 5000 ppm (metal ion concentration) of alkaline earth metal ion (B);
1 to 5000 ppm (metal ion concentration) of metal ion (C) of Group III in the periodic
table; and
0.5 to 100 ppm (metal ion concentration) of copper ion (D); and
wherein said chemical conversion coating agent does not substantially contain phosphate
ions, and
wherein said silicon-containing compound (E) is a silane coupling agent,
and the said chemical conversion coating agent has a pH of 1.5 to 6.5.

2. (Previously Presented) The chemical conversion coating agent according to Claim
1,
wherein the alkaline earth metal ion (B) is at least one kind selected from the group
consisting of magnesium ion, calcium ion, barium ion and strontium ion, and
the metal ion (C) of Group III in the periodic table is at least one kind selected from the
group consisting of aluminum ion, gallium ion and indium ion.

3. (Previously presented) The chemical conversion coating agent according to Claim 1, containing

1 to 5000 ppm of at least one kind of a chemical conversion reaction accelerator selected from the group consisting of nitrite ion, nitro group-containing compounds, hydroxylamine sulfate, persulfate ion, sulfite ion, hyposulfite ion, peroxides, iron (III) ion, citric acid iron compounds, bromate ion, perchlorinate ion, chlorate ion, chlorite ion, as well as ascorbic acid, citric acid, tartaric acid, malonic acid, succinic acid and salts thereof.

4. (Withdrawn) A surface-treated metal comprising
a chemical conversion coat formed by the chemical conversion coating agent according to Claim 1 on a surface thereof.

5. (Withdrawn) The surface-treated metal according to Claim 4,
wherein the chemical conversion coat has a coat amount of 0.1 to 500 mg/m² in a total amount of metals contained in the chemical conversion coating agent.

6. (Previously presented) The chemical conversion coating agent according to Claim 2, containing

1 to 5000 ppm of at least one kind of a chemical conversion reaction accelerator selected from the group consisting of nitrite ion, nitro group-containing compounds, hydroxylamine sulfate, persulfate ion, sulfite ion, hyposulfite ion, peroxides, iron (III) ion, citric acid iron compounds, bromate ion, perchlorinate ion, chlorate ion, chlorite ion, as well as ascorbic acid, citric acid, tartaric acid, malonic acid, succinic acid and salts thereof.

7. (Withdrawn) A surface-treated metal comprising
a chemical conversion coat formed by the chemical conversion coating agent according to Claim 2 on a surface thereof.

8. (Withdrawn) A surface-treated metal comprising
a chemical conversion coat formed by the chemical conversion coating agent according
to Claim 3 on a surface thereof.

9. (Withdrawn) A surface-treated metal comprising
a chemical conversion coat formed by the chemical conversion coating agent according
to Claim 6 on a surface thereof.

10. (Withdrawn) The surface-treated metal according to Claim 7,
wherein the chemical conversion coat has a coat amount of 0.1 to 500 mg/m² in a total
amount of metals contained in the chemical conversion coating agent.

11. (Withdrawn) The surface-treated metal according to Claim 8,
wherein the chemical conversion coat has a coat amount of 0.1 to 500 mg/m² in a total
amount of metals contained in the chemical conversion coating agent.

12. (Withdrawn) The surface-treated metal according to Claim 9,
wherein the chemical conversion coat has a coat amount of 0.1 to 500 mg/m² in a total
amount of metals contained in the chemical conversion coating agent.

13. (New) A chemical conversion treatment method for coating comprising converting
the surface of metal with a chemical conversion coating agent,
wherein said chemical conversion coating agent comprises:
at least one member selected from the group consisting of zirconium, titanium and
hafnium;
fluorine; and an adhesion and corrosion resistance imparting agent,
wherein said adhesion and corrosion resistance imparting agent comprises 1 to 5000 ppm
(as a silicon component) of a silicon-containing compound (E) and at least one member selected
from the group consisting of:

1 to 5000 ppm (metal ion concentration) of at least one kind of metal ion (A) selected from the group consisting of zinc ion, manganese ion and cobalt ion;

1 to 5000 ppm (metal ion concentration) of alkaline earth metal ion (B);

1 to 5000 ppm (metal ion concentration) of metal ion (C) of Group III in the periodic table; and

0.5 to 100 ppm (metal ion concentration) of copper ion (D); and

wherein said chemical conversion coating agent does not substantially contain phosphate ions, and

wherein said silicon-containing compound (E) is a silane coupling agent,

and the said chemical conversion coating agent has a pH of 1.5 to 6.5.

14. (New) The chemical conversion treatment method for coating according to claim 13, wherein said method is preformed by dipping or spraying.

15. (New) The chemical conversion treatment method for coating according to claim 13, which further comprises post rinsing after converting.

16. (New) The chemical conversion treatment method for coating according to claim 13, which is followed by coating without drying.

17. (New) The chemical conversion treatment method for coating according to claim 13, wherein the alkaline earth metal ion (B) is at least one kind selected from the group consisting of magnesium ion, calcium ion, barium ion and strontium ion, and

the metal ion (C) of Group III in the periodic table is at least one kind selected from the group consisting of aluminum ion, gallium ion and indium ion.

18. (New) The chemical conversion treatment method for coating according to claim 17, wherein said chemical conversion coating agent contains

1 to 5000 ppm of at least one kind of a chemical conversion reaction accelerator selected from the group consisting of nitrite ion, nitro group-containing compounds, hydroxylamine

sulfate, persulfate ion, sulfite ion, hyposulfite ion, peroxides, iron (III) ion, citric acid iron compounds, bromate ion, perchlorinate ion, chlorate ion, chlorite ion, as well as ascorbic acid, citric acid, tartaric acid, malonic acid, succinic acid and salts thereof.

19. (New) The chemical conversion treatment method for coating according to claim 13, wherein said chemical conversion coating agent contains

1 to 5000 ppm of at least one kind of a chemical conversion reaction accelerator selected from the group consisting of nitrite ion, nitro group-containing compounds, hydroxylamine sulfate, persulfate ion, sulfite ion, hyposulfite ion, peroxides, iron (III) ion, citric acid iron compounds, bromate ion, perchlorinate ion, chlorate ion, chlorite ion, as well as ascorbic acid, citric acid, tartaric acid, malonic acid, succinic acid and salts thereof.

20. (New) The chemical conversion treatment method for coating according to claim 17, which further comprises post rinsing after converting.

21. (New) The chemical conversion treatment method for coating according to claim 18, which further comprises post rinsing after converting.

22. (New) The chemical conversion treatment method for coating according to claim 19, which further comprises post rinsing after converting.

23. (New) The chemical conversion treatment method for coating according to claim 17, wherein said method is preformed by dipping or spraying.

24. (New) The chemical conversion treatment method for coating according to claim 18, wherein said method is preformed by dipping or spraying.

25. (New) The chemical conversion treatment method for coating according to claim 19, wherein said method is preformed by dipping or spraying.